

**REMARKS**

Applicants respectfully submit that all the claims presently on file are in condition for allowance, which action is earnestly solicited.

**PRELIMINARY AMENDMENT**

The office action indicates that in Applicants' Preliminary Amendment dated 10-24-03, "applicant adds into the first line of the specification that this application is a continuation of application serial # 10/087,711. However, application serial # 10/087,711 was abandoned on 8-21-03, which is before the filing date 10-24-03 of this application and therefore it appears that this application cannot claim priority to application serial # 10/087,711."

In response Applicants enclose herewith a copy of the Decision from the Office of Petitions, dated March 26, 2004, which acknowledges the revival of patent application serial # 10/087,711 for the purpose of continuity. As a result, the continuity and priority information of the present application, as claimed in the Preliminary Amendment is still valid, and no further amendment is necessitated.

**THE SPECIFICATION**

The Abstract was objected to on the ground that "it contains over 150 words." Applicants respectfully submit that the Abstract has now been revised accordingly.

**THE CLAIMS**

**CLAIM REJECTION UNDER 35 USC 112**

Claims 1, 3-8, and 11-14 were rejected under 35 USC 112, second paragraph for containing certain informality. This informality has now been corrected in satisfaction of 35 USC 112, second paragraph.

**CLAIM REJECTION UNDER 35 USC 103**

Claims 1, 3-8 and 11-13 were "rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 1,875,985 to Brandt in view of IT Patent No. 487021". Applicants respectfully submit that the cited references, whether considered individually or in combination with each other, do not disclose all the elements and limitations of the rejected claims. Consequently, the claims presently on file are not obvious in view of the cited references, and the allowance of these claims is earnestly solicited. In support of this position, Applicants submit the following arguments:

**A. Legal Standard of Obviousness**

The following legal authorities set the general legal standards in support of Applicant's position of non obviousness, with emphasis added for added clarity:

- MPEP 706.02(j), **"To establish a prima facie case of obviousness, three basic criteria must be met.** First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) ... The initial burden is on the examiner to provide some **suggestion of the desirability** of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the **references must expressly or impliedly suggest the claimed invention** or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)."
- **In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is** not whether the differences themselves would have been obvious, but **whether the claimed invention as a whole would have been obvious.** The prior art perceived a need for mechanisms to dampen resonance, whereas the inventor eliminated the need for dampening via the one-piece gapless support structure. "Because that insight was contrary to the understandings and expectations of the art, the structure effectuating it would not have been obvious to those skilled in the art." 713 F.2d at 785, 218 USPQ at 700 (citations omitted).
- MPEP §2143.03, "All Claim Limitations Must Be Taught or Suggested: To establish prima facie obviousness of a claimed invention, **all the claim limitations must be taught or suggested by the prior art.** In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). **"All words in a claim must be considered** in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)."
- MPEP §2143.01, "The Prior Art Must Suggest The Desirability Of The Claimed Invention: There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the

prior art, and the knowledge of persons of ordinary skill in the art." In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (**The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held improper.**). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. Al-Site Corp. v. VSI Int'l Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

- "**Obviousness cannot be established** by combining the teachings of the prior art to produce the claimed invention, **absent some teaching or suggestion** supporting the combination." In re Fine, 837 F.2d at 1075, 5 USPQ2d at 1598 (citing ACS Hosp. Sys. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)). **What a reference teaches** and whether it teaches toward or **away from the claimed invention** are questions of fact. See Raytheon Co. v. Roper Corp., 724 F.2d 951, 960-61, 220 USPQ 592, 599-600 (Fed. Cir. 1983), cert. denied, 469 U.S. 835, 83 L. Ed. 2d 69, 105 S. Ct. 127 (1984). "
- "When a rejection depends on a combination of prior art references, there must be **some teaching, suggestion, or motivation** to combine the references. See In re Geiger, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987)." **Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation** to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See MPEP 2143.01; In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).
- "With respect to core factual findings in a determination of patentability, however, the **Board cannot simply reach conclusions based on its own understanding or experience** – or on its assessment of what would be basic knowledge or common sense. **Rather, the Board must point to some concrete evidence in the record** in support of these findings." See In re Zurko, 258 F.3d 1379 (Fed. Cir. 2001).
- "We have noted that **evidence of a suggestion, teaching, or motivation to combine** may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.,

75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), Para-Ordinance Mfg. v. SGS Imports Intern., Inc., 73 F.3d 1085, 1088, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995), although "the suggestion more often comes from the teachings of the pertinent references," Rouffet, 149 F.3d at 1355, 47 USPQ2d at 1456. The range of sources available, however, does not diminish the requirement for actual evidence. That is, **the showing must be clear and particular**. See, e.g., C.R. Bard, 157 F.3d at 1352, 48 USPQ2d at 1232. **Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence."** E.g., McElmurry v. Arkansas Power & Light Co., 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993) ("Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact."); In re Sichert, 566 F.2d 1154, 1164, 196 USPQ 209, 217 (CCPA 1977). See In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999).

- "To prevent the use of hindsight based on the invention to defeat patentability of the invention, **this court requires the examiner to show a motivation to combine the references** that create the case of obviousness. In other words, **the examiner must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references **for combination in the manner claimed**." See In re Rouffet, 149, F.3d 1350 (Fed. Cir. 1998).
- The mere fact that references can be combined or modified does not render the resultant combination obvious **unless the prior art also suggests the desirability of the combination**. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, **there must be a suggestion or motivation in the reference** to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope not suggested by combination of prior art references).
- If the **proposed modification would render the prior art invention being modified unsatisfactory** for its intended purpose, **then there is no suggestion or motivation** to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

## **B. Brief Summary of the Present Invention**

Prior to presenting substantive arguments in favor of the allowability of the claims on file, it might be desirable to summarize the present invention. The present invention presents a projectile that comprises **three main components**: a **center vent tube**, a plurality of vent holes, and a corresponding plurality of vent plugs.

### **In summary, the primary functions of the center vent tube are:**

- (1) To compensate for the weight of the explosives.** The center vent tube provides the same or similar center of gravity location of the projectile as that of the M720 HE mortar cartridge. The center vent tube provides the same or similar weight for the projectile as for the M720 HE mortar cartridge filled with explosives.
- (2) To maintain the physical properties of M720 HE projectile for retaining similar ballistics of the tactical rounds.** The center vent tube provides the same or similar axial and transversal moments of inertia to the projectile as those for the M720 HE mortar cartridge.
- (3) to provide a passage for an efficient smoke release upon fuze function.**

The vent holes are designed and positioned at the rear end of the projectile body to sufficiently release pressure, flame, and smoke that traveling through the center vent tube upon impact.

The vent holes are sealed with corresponding vent plugs to protect the interior of the projectile from dirt and moisture during storage, handling, and interior pressurization during launch. Without the vent plug, the fuze may

prematurely detonate by the rapid pressurization by burning propellant charges in the gun tube during launch. The plugs are designed to pop out when interior of projectile is pressurized upon fuze function, and to allow the release of pressure, flame, and smoke through vent holes from the center vent tube.

### **C. Application of the Obviousness Standard to the Present Invention**

#### **C.1. Independent Claim 1 - Elements Not Disclosed By the Cited References**

Applicants respectfully submit that the following elements and combination of elements and resulting features recited in claim 1 and the claims dependent thereon, are not disclosed in the cited references:

"1. A projectile for use with a gun system, comprising:  
a fuze;  
a projectile body including an open front end and a closed rear end;  
wherein the front end of the projectile body is secured to the fuze;  
a boom assembly secured to the closed end of the projectile body;  
**a center vent tube having** a forward end that is secured to the fuze,  
and **a rearward end that abuts against the rear end of the projectile body, to form a smoke chamber and to provide added weight to control a center of gravity of the projectile;**  
wherein the rear end of the projectile body includes **a plurality of normally closed vent holes that are disposed in closed proximity to the boom assembly, in fluidic communication with the smoke chamber;** and  
a plurality of vent plugs that fit in the vent holes to plug the vent holes, wherein the vent plugs become unplugged from the projectile body upon function of the fuze, and allow smoke that accumulates inside the smoke chamber to be released so as to provide a signature for the projectile." Emphasis added.

C.2. Elements not disclosed by the main reference, Brandt

The Examiner states that: "**Brandt does not disclose a center vent tube** having a forward end that is secured to the fuse **and a rearward end that abuts against the rear end of the projectile body, to form a smoke chamber and to provide added weight to control a center of gravity of the projectile.**"

Emphasis added.

Applicants agree with the Examiner that the main reference, namely Brandt, does not disclose two fundamental aspects of the present invention, namely:

- (1) The center tube; and
- (2) the rearward end positioning relative to the projectile body.

Let us consider now each of these missing components independently, in view of its functionality relative to the present invention. As stated earlier, one of the main functions of the center tube is to compensate for the weight of the explosives, by providing the same or similar center of gravity location of the projectile as that of a combat mortar cartridge that is filled with explosives.

**Brandt** addresses the same or similar concern, and **explicitly proposes a completely different solution** than the center tube of the present invention. More specifically, Brandt indicates, at column 2, lines 9-15, as follows:

"It will be clearly evident that the projectile according to the invention can easily be given the same weight and also the same balance as prior projectiles of the same type and calibre, **by suitably distributing the material corresponding to the recess 2 over the walls and interior of the latter.**" Emphasis added.



In other terms, Brandt expressly teaches the distribution of material to compensate for the missing weight of the explosives. **As a result, the use of a center tube in Brandt would be useless and redundant,** and in fact, any added **center tube would be detrimental to the design of Brandt,** in that it would disturb the weight distribution and defeat the purpose of the Brandt teaching. The weight distribution is already regulated by a compensatory distribution, and thus to add another weight distribution mechanism would be incompatible with the already balanced design of Brandt. In summary, **Brandt teaches away from the use of an additional center tube as taught by the present invention.**

In addition, another feature of the center tube of the present invention is to provide a passage for an efficient smoke release upon fuze function. Brandt teaches the use of the projectile body as a passage for smoke release, obviating the use of additional means to duplicate this function. Brandt does not mention any reason or indication for adding a center tube to aid in the dispensation of the smoke. Moreover, and as it will be explained later in more detail, the addition of the center tube, would still not become a viable dispensation avenue for the smoke, in that the center tube will not be in fluidic communication with the vent holes.

### C.3. The combination of Brandt and the Italian reference is improper

In support of the combination of Brandt and the Italian reference, the office action states:

"The Italian patent does disclose a center vent tube - proximate 4, having a forward end that is secured to the fuse - at 7-12, and a

rearward end that abuts against the rear end of the projectile body - at 2, to form a smoke chamber and to provide added weight to control a center of gravity of the projectile - see the drawing figure. Therefore it would have been obvious to one of ordinary skill in the art to take the device of Brandt and add the center vent tube of the Italian patent so as to allow for the device to be able to quickly three the gas/smoke from the projectile body along a desired path." Emphasis added.

Applicants respectfully traverse this rejection ground, and state that Brandt and the Italian reference cannot be properly combined, as submitted by the Examiner, in that neither reference discloses a motivation for such combination. As clearly explained by the legal authorities above, the **court requires that the examiner show a motivation to combine the references** that create the case of obviousness. In other words, **the examiner must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references **for combination in the manner claimed.**"

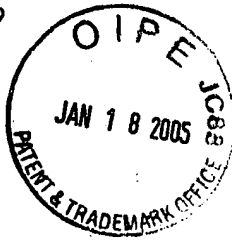
Applicants submit that the office action does not provide such justifiable reasons. A wish or a desire to have a training projectile simulate a live projectile, without more reasoning, is insufficient to satisfy the legal requirements for an obviousness rejection.

More specifically, the office action states that the center tube is used "to form a smoke chamber and to provide added weight to control a center of gravity of the projectile." However, **the office action does not address the main functionality of the center tube, namely to establish a fluid communication with the vent tube, so that the accumulated smoke is released.**

In addition, based solely on the interpretation of the drawing figure of the Italian reference, it is not clear to Applicants that the center tube will act as a smoke chamber, in that the explosives seem to be dispensed around the center tube, and thus, upon activation, the smoke generated by the explosives would appear to surround the center tube as opposed to penetrating it, so that the smoke would be subsequently released.

Furthermore, and as indicated by the two drawings sheets below, even if the Brandt design were modified by adding the center tube to the Brandt design, the modified design would still not operate in the same or similar manner as recited in the instant claim 1, particularly that the center tube has not been taught by either reference as a smoke chamber, and also because **the center tube does not establish a fluid communication with the vent holes**, to allow the accumulated smoke to be released from the vent holes, thus defeating one of the main objectives of the present invention.

Based on the legal authorities above, neither Brandt, the Italian reference, nor the combination thereof, describes essential elements of the present invention, and consequently, claim 1, as amended is not obvious in view of these references. Therefore, claim 1 and the claims dependent thereon are allowable, and such allowance is respectfully requested. In addition, with respect to the dependent claims, Applicants do not assert each individual feature independently in the abstract, but rather in combination with the elements of claim 1.



**CONCLUSION**

All the claims presently on file in the present application are in condition for immediate allowance, and such action is respectfully requested. If it is felt for any reason that direct communication would serve to advance prosecution of this case to finality, the Examiner is invited to call the undersigned at the below-listed telephone number.

Respectfully submitted,

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Enclosure; Copy of Decision from the Office of Petitions